United States Department of the Interior

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
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SALT LAKE CITY, UTAH 84111-2303

TAKE PRIDE IN AMERICA

1702
(U-932)

JUL 2 0 1989

Memorandum

To: Service Center Director (SC-140)
Attention: Mary Gaylord

From: State Director, Utah

Subject: Bonneville Salt Flats Research and Development (R&D) Proposal

Attached is an R&D proposal, Salt Loss on the Bonneville Salt Flats ACEC. The proposal contains a statement of need and project prospectus. Please put this on the agenda for the August 15, 1989, field committee meeting so that it can be considered for funding in the fiscal year 1990 budget.

The Bonneville Salt Flats are a world famous geologic feature in western Utah. It is a national resource known to millions of sightseers as a stark but scenic attraction where yearly events of high speed automobile land records racing is done. Racing is done in over a hundred different classes.

Salt loss from the flats has been controversial for many years. Studies by State and Federal agencies have confirmed that a problem exists but fail to provide for a solution. This proposal is designed to achieve long-term preservation of the salt flats by eliminating salt loss and/or replacing salt.

Action
Info

Kemp Conn

ACTING

	Init.	Date
[illegible]		7/26
[illegible]		7-26
Public Affairs		
[illegible]		
[illegible]		
[illegible]		
[illegible]		
Energy Exercise EA		7/
Bear River EA		
[illegible]	SE	7/2

Good job!

Attachment
Proposal (9 pp.)

cc: District Manager, Salt Lake
Attention: Leon Berggren

STATEMENT OF NEED

I. SUBJECT AREA

The Bonneville Salt Flats are a world famous geologic feature in western Utah. They are known to millions of sightseers as a stark, but scenic attraction, perhaps one of a kind in the world. The salt flats were identified in the Pony Express RMP as an Area of Critical Environmental Concern.

II. DESCRIPTION OF AREA OF CONCERN

A. Problem

The volume of salt crust on the Bonneville Salt Flats is being reduced at a rate of approximately 1% per year (Brooks, 1988), apparently due to withdrawals of brine from the shallow aquifer.

B. User Groups:

1. Commercial Filmers

Types of filming:
- still photography (geophysical to fashion models
- video product documentaries
- commercials for TV
- motion feature movies

Resource requirements to continue filming activities:
solid crust salt base that will support vehicles and equipment trucks. White surface.

Average number of permits issued/yr for commercial filming:
14 permits
3 day average stay
25 average number of cast/crew

Impact on local economy: significant dollars spent in Utah (SLC & Wendover) for scouts, vehicle rentals, food, gas, motel, etc. Filming activities are strongly supported by Utah State Filming Commission.

Significance/Uniqueness (importance): No where else in the USA, can one find solid surface of pure white.

Foreground/Background: Extreme importance. Filmers come from Spain, Canada, Germany, France, England, and all over the USA to obtain the unique white

surface shot. Note: Most filming support is contracted out of Los Angeles, California or New York.

2. Competitive Events

High speed automobile trails - Land speed record racing in over a hundred classes.

Resource requirements: Solid, smooth salt crust base to support vehicles up to 600 mph. Minimum of 3" halite crystal crust required to support LSR race cars and pit, support vehicles (semi-tractor trailers) over distances of 12 miles. Salt loss reduces the length of the track.

Average number of permits/year = 10

- 5 day average stay
- 50 people on small events/day
- 200 on medium event/day
- 1000 on large events: Speed week/day.

Impact on local economy - Significant during speed week: Motels, food, services, rentals, etc.

Significance: Other dry lake beds offer some opportunity, but none hold up as well for repeated runs and none have the same friction/traction qualities of the salt surface.

C. MBO -When funded, the study will be added to MBO list.

D. Goals and Objectives

1. Document changes in the hydrologic system since Lines (1979).

2. Establish a network to monitor future changes in water levels, water chemistry, and salt thickness in the Bonneville salt flats.

3. Assess the impacts of minerals development on hydrologic system. This includes impacts on groundwater chemistry, water levels, and salt deposits in the Bonneville salt flats.

4. Quantitatively evaluate methods for replacing salt on the salt flats.

The above listed objectives are designed to achieve long-term preservation of the salt flats by eliminating salt loss and/or replacing salt.

5. The output will be a report quantifying causes of salt loss and potential methods to reduce salt loss and/or replace lost salt. It is anticipated that the report will provide the technical basis to take necessary legal steps to preserve the salt flats.

6. The USGS Salt Lake Water Resources Division has proposed a 3 year study. The first two years would consist of field investigations and the third year would consist of data analysis and report preparation. The final report is needed no later than 1992.

III. JUSTIFICATION

Salt loss has been controversial for many years. Studies by State and Federal agencies have confirmed that a problem exists but fail to provide for a solution. These studies have been rebutted in part by potash industry funded studies. Existing Salt Lake District funding was utilized in 1988 to conduct a drilling survey of salt thickness which confirmed the problem of salt loss, however, the exact mechanisms and quantification of salt crust loss have not been determined to a degree sufficient to allow the Bureau to propose and implement an effective solution, especially in light of the potential adverse effects on the potash industry.

IV. CONCURRENCE BLOCK:

State Organization

Employee Originating the Statement Steven Brooks 6/29/89 Date

District Manager Deane H. Zeller 6/29/89 Date

Research Review Committee Boyd J. Christensen 7/19/89 Date

Associate State Director Kent Conover 7/19/89 Date

State Director Kent Conover, Acting 7/19/89 Date

Service Center

Employee Originating the Statement _____ Date

Div. Chief, Svc. Cen. _____ Date

Research Review Committee _____ _____
Date

Assistant Director Svc. Ctr. _____ _____
Date

Svc. Cen. Director _____ _____
Date

PROJECT PROSPECTUS

TITLE: Salt Loss on the Bonneville Salt Flats ACEC

RDTS Number_____ Category_____

Principal investigators would be Lee Case, Kidd Waddell and Joe Gates of the USGS, Water Resource Div., Salt Lake City, Utah.

PROBLEM: The U.S. Bureau of Land Management needs quantitative scientific information in order to quantify the potential effects of development of mineral resources and causes of salt loss in the vicinity of the Bonneville Salt Flats. In the past 10 years, significant climatic variations have imposed measurable stresses on the hydrologic system. There is a need to evaluate these stresses, apply new technology where appropriate, and revise, if needed, previous hydrologic studies in the area.

OBJECTIVE:

A. --Document changes in the hydrologic system since Lines (1979)

B. --Establish a network to monitor future changes in water levels, water chemistry, and salt thickness in the Bonneville Salt Flats

C. --Assess the impacts of minerals development on the hydrologic system. This includes impacts on groundwater chemistry, water levels, and salt deposits in the Bonneville Salt Flats.

APPROACH:

1. Gather data collected since Lines (1979). Include public and private sources (Reilly, BLM, Consultants, Dames & Moore, Turk, Duffy, etc.). Specifically, look for aquifer property data, water levels in wells, density of fluid when water levels were measured in wells, water chemistry, lithology, etc.

2. Store new data in computer data base--WATSTORE, ARC/INFO (A Geographic Information System) are both on line in Utah.

3. Visit wells installed by Lines (1979) and other sources to determine which wells can be used for observation.

4. Establish an observation-well network using all available wells. Densities would be determined at time of measurement. Seasonal changes will be documented. Measure thickness and chemical composition of salt at selected locations in the salt flats.

5. Collect water samples from as many wells as possible. Look for changes over time.

6. Drill monitoring wells where no well exists or key previously existing wells have been destroyed.

7. Review aquifer tests conducted by others since Lines (1979). Conduct additional tests (slug, etc.) as appropriate where possible.

8. Review/revise water and salt balance as calculated by Lines. Use weather data collected at stations established for the Newfoundland Evaporation Basin project.

9. Impose climatic and Newfoundland Evaporation Basin stage data as stresses on the hydrologic system and simulate groundwater flow and chemistry changes. A 3-D solute-transport model by Kipp (1987) and 2-D cross-sectional model by Konikow may be used. Final selection of the model(s) to be used will be made after a review of existing, appropriate, published, and documented models.

10. Apply the geochemical model SNORM to evaluate salt balance (including salt crust thickness and extent) and geochemistry separating short and long-term climatic influences on the salt flats from "man-caused" impacts.

11. Compare model-generated water and salt balance with Lines (1979).

12. Quantitatively evaluate methods to mitigate salt loss and/or replace salt.

13. Simulate future water level and ground-water chemistry using alternative scenarios supplied by Reilly and BLM.

14. Prepare and publish a report describing the results of investigation.

15. Suggest wells that should be monitored in the future.

PERSONNEL AND FUNDING:

	FY'89	FY'90	FY'91
Hydrologist	60,000	60,000	65,000
Hydrologic Tech.	30,000	30,000	25,000
Vehicle/pd	2,500	2,500	1,000
Equipment/Supplies	3,000	1,500	1,500
Chemical Analyses	4,500	15,000	4,500
Drilling	--	20,000	--
Publications	--	--	5,000
Totals	100,000 +	129,000 +	102,000 = 331,000

FUNDING*

	Anticipated	Additional Per Year
BLM - Utah	10,000	5,000
Denver Service Center	0	10,000
Washington Office	0	95,000

*Per Year for 3 years projected Total $330,000

REFERENCES

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